SE-221

Shock exciter



Applications

- ✓ shock testing of small assemblies/parts
- ✓ secondary calibration of shock transducers and measuring chains according to ISO 16063-22
- ✓ secondary calibration of shock accelerometer reference standards

Selected Data

- ✓ shock amplitudes up to 200 000 g_n
- ✓ sensor mass (DUT) up to 15 g / 30 g (depending on selection of bar)
- ✓ position of DUT is horizontal
- ✓ 4 bar air supply

Features

- ✓ sinusoidal shock as type of excitation
- ✓ realization of all automatic calibrations according to own test regime (up to 20 shocks/minute)
- ✓ excellent repeatability of shock
- ✓ Range of Use:
  - · accredited calibration laboratories
  - · departments of measuring instrument verification (RnD, aviation, space industry)
  - · quality assurance in sensor manufacturing
  - · NMI as highest measurement authorities

Specification

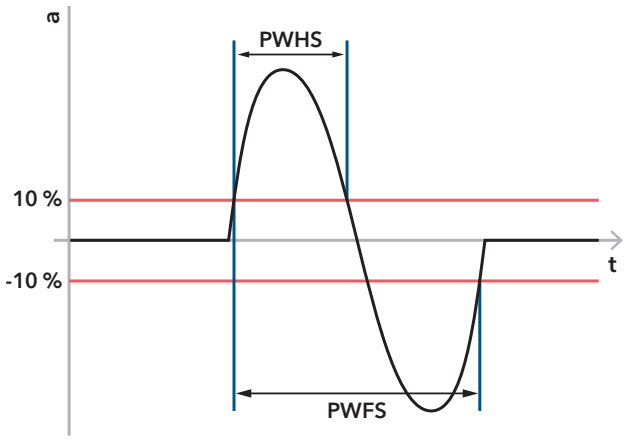
The SPEKTRA SE-221 shock exciter is determined for testing and calibrating acceleration sensors. It is specified to provide sinusoidal one period shock excitations and works according to the Hopkinson-bar principle. It makes use of the propagation and reflection characteristics of a mechanical wave in a slender bar.

The SE-221 consists of a shock exciter barrel and a Hopkinson bar made of titanium. Both are mounted on an aluminum beam. Within the barrel, a projectile is accelerated pneumatically, hitting the end of the bar in an adjustable distance thus exciting the strain pulse within the bar. A pneumatic control allows to retract the projectile after each shot by applying a negative pressure. While the air pressure is kept constant, the kinetic energy of the projectile can be controlled by a motor-driven mechanical stop that allows a precise adjustment of the projectile's starting position. Thus the SE-221 allows an automatic control of the shock amplitude.

All mechanical parts are built from wear-resistant materials, ensuring best stability of the shock exciter and providing a good repeatability of shocks.

Technical data

	High shock bar	Very high shock bar
Shock acceleration	1 000 g_n ... 100 000 g_n	5 000 g_n ... 200 000 g_n
Pulse width PWFS / PWHS, typical [1)]	46 µs ... 38 µs / 23 µs ... 19 µs	42 µs ... 34 µs / 21 µs ... 17 µs
Sensor mass (DUT), max.	30 g (1 oz)	15 g (0.5 oz)
Dimensions, approx. (H × W × L)	1.3 m × 1 m × 4 m (4.3 ft × 3.3 ft × 13 ft)	
Air pressure	4 bar	



1) PWHS = Pulse Width Half Sine Wave;
PWFS = Pulse Width Full Sine Wave

All data for environmental conditions: temperature 23°C (± 2°C) and relative humidity 30 % ... 75 %

Determined according to GUM (ISO Guide to the expression of uncertainty in measurement, 1995) with k = 2 (coverage factor)

Components

- ✓ pneumatically driven pulse generator
- ✓ reference standard strain gauge BN-19
- ✓ Shock Control Unit